

# Generalised quantum dynamics and interaction of atoms with quantum fields

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## Abstract

We investigate the effects of the nonlocality in time of the effective interaction of atoms with quantum fields, arising after integrating out certain degrees of freedom. We show that these effects can be described, in a natural way, within the formalism of the generalized quantum dynamics developed in [J. Phys. A 32, 5657 (1999)]. The new possibilities that the generalized quantum dynamics opens for solving the problem are demonstrated by using the example of a muonic atom interacting with the electronic vacuum.

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## Keywords

Atoms, Nonlocal interactions, Polarization of vacuum